

MATERIAL SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

National Institute of Standards and Technology
Standard Reference Materials Program
100 Bureau Drive, Stop 2320
Gaithersburg, Maryland 20899-2320

SRM Number: 676
MSDS Number: 676
SRM Name: Alumina Internal Standard
for Quantitative Analysis by
X-ray Powder Diffraction

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Description: This Standard Reference Material (SRM) consists of an alumina powder (corundum structure) intended primarily for use as an internal standard for quantitative analysis by X-ray powder diffraction. A unit of SRM 676 consists of approximately 20 g of powder bottled in an argon atmosphere.

Substance: Alumina.

Other Designations: Alumina (alundum; alumina; dialuminum trioxide; aluminum sesquioxide; alpha-alumina; beta-alumina; gamma-alumina; alumite; almite; martoxin; aluminum oxide; aluminum trioxide)

2. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Component	CAS Registry	EC Number (EINECS)	Concentration (%)
Alumina	1344-28-1	215-691-6	100

Index, R/S Phrases (EC): Not determined.

3. HAZARDS IDENTIFICATION

NFPA Ratings (Scale 0–4): Health = 1 Fire = 0 Reactivity = 0

Major Health Hazards: No significant health hazards reported.

Physical Hazards: Not applicable to the identified SRM.

Potential Health Effects (short term exposure)

Inhalation: Irritation to the mucous membranes and respiratory tract.

Skin Contact: Irritation.

Eye Contact: Irritation.

Ingestion: No information on significant adverse effects.

Listed as a Carcinogen/Potential Carcinogen

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens	<input type="checkbox"/>	<input checked="" type="checkbox"/>
In the International Agency for Research on Cancer (IARC) Monographs	<input type="checkbox"/>	<input checked="" type="checkbox"/>
By the Occupational Safety and Health Administration (OSHA)	<input type="checkbox"/>	<input checked="" type="checkbox"/>

4. FIRST AID MEASURES

Inhalation: If adverse effects occur, remove to uncontaminated area. If not breathing, give artificial respiration by qualified personnel. Get immediate medical attention.

Skin Contact: Wash affected skin with soap and water for at least 15 minutes while removing contaminated clothing. Get medical attention, if needed.

Eye Contact: Immediately flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Get immediate medical attention.

Ingestion: If a large amount is swallowed, get immediate medical attention.

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Negligible fire hazard.

Extinguishing Media: Use extinguishing media appropriate for the surrounding fire.

Fire Fighting: Avoid inhalation of material or combustion by-products. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

Flash Point (°C): Not applicable **Autoignition (°C):** Not applicable **Method:** Not applicable

Flammability Limits in Air (Volume %): Upper: Not applicable

Lower: Not applicable

Flammability Class (OSHA): Not applicable.

6. ACCIDENTAL RELEASE MEASURES

Occupational Release: Collect spilled material in appropriate container for proper disposal. Keep out of water supplies and sewers. Refer to Section 13 “Disposal Considerations”.

7. HANDLING AND STORAGE

Storage: Store and handle in accordance with all current regulations and standards. Store in a tightly sealed container. Keep separated from incompatible substances.

Safe Handling Precautions: Wear splash resistant safety goggles. Wear chemical resistant clothing and gloves. An eye wash station and washing facilities should be readily available near handling and use areas. Use methods to minimize dust. See Section 8 “Exposure Controls and Personal Protection”.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Alumina

OSHA TWA: 5 mg/m³ (respirable dust fraction)

OSHA TWA: 15 mg/m³ (total dust)

ACGIH TWA: 10 mg/m³ (inhalable fraction)

UK WEL TWA: 10 mg/m³ (total inhalable dust)

UK WEL TWA: 4 mg/m³ (respirable dust)

Ventilation: Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

Respirator: If necessary, refer to the “NIOSH Guide to the Selection and Use of Particulate Respirators Certified under 42 CFR 84” for selection and use of respirators certified by NIOSH.

Eye Protection: Wear safety goggles with a faceshield. **DO NOT** wear contact lenses in the laboratory. An eye wash station should be readily available near of handling and use areas.

Personal Protection: Wear protective clothing and chemically resistant gloves to prevent skin exposure.

9. PHYSICAL AND CHEMICAL PROPERTIES

Alumina
Appearance and Odor: odorless white to gray powder
Molecular Formula: Al ₂ O ₃
Relative Molecular Mass: 101.96
Density (g/cm³): 3.96
Melting Point (°C): ≈ 2060
Solubility in Water (%): insoluble
Solvent Solubility: slightly soluble in mineral acids and strong alkali; insoluble in nonpolar organic solvents

10. STABILITY AND REACTIVITY

Stability: ☒ Stable ☐ Unstable

Stable at normal temperatures and pressure.

Conditions to Avoid: Avoid generating dust.

Incompatible Materials: Halo carbons, halogens, combustible materials, oxidizing materials.

Fire/Explosion Information: See Section 5 “Fire Fighting Measures”.

Hazardous Decomposition: Thermal decomposition produces miscellaneous products.

Hazardous Polymerization: ☐ Will Occur ☒ Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Entry: ☒ Inhalation ☒ Skin ☒ Ingestion

Alumina

TC_{LO} (intermittent inhalation-rat): 200 mg/m³/5h – 28 weeks

Carcinogen Status: ACGIH: A4 - Not Classifiable as a Human Carcinogen

Health Effects (Acute Exposure)

Inhalation of high concentrations of alumina may cause coughing, shortness of breath, respiratory tract irritation due to mechanical action, unpleasant deposits in the nasal passages, and exacerbation of symptoms in persons with impaired pulmonary function. Skin contact may cause irritation and allergic skin reactions. Eye contact may cause irritation with possible swelling of the conjunctiva. No data is available for ingestion.

Medical Conditions Generally Aggravated by Exposure: Respiratory disorders.

12. ECOLOGICAL INFORMATION

Environmental Summary: Not available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose in accordance with all applicable federal, state, and local regulations.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: No classification assigned.
Canadian Transportation WHMIS: No classification assigned.

15. REGULATORY INFORMATION

U.S. REGULATIONS

CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated.
SARA Title III Section 302 (40 CFR 355.30): Not regulated.
SARA Title III Section 304 (40 CFR 355.40): Not regulated.
SARA Title III Section 313 (40 CFR 372.65): Not regulated.
OSHA Process Safety (29 CFR 1910.119): Not regulated.
SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21)

ACUTE: No
CHRONIC: Yes
FIRE: No
REACTIVE: No
SUDDEN RELEASE: No

STATE REGULATIONS

California Proposition 65: Not regulated.

CANADIAN REGULATIONS

WHMIS Classification: Not determined.

EUROPEAN REGULATIONS

EC Classifications: Not determined.

NATIONAL INVENTORY STATUS

U.S. Inventory (TSCA): Listed on inventory.
TSCA 12(b), Export Notification: Not listed.

16. OTHER INFORMATION

Sources: MDL Information Systems, Inc., MSDS *Alumina*, 16 June 2005.

Disclaimer: Physical and chemical data contained in this MSDS are provided only for use as a guide in assessing the hazardous nature of the material. The MSDS was prepared carefully, using current references; however, NIST does not certify the data in the MSDS. The certified values for this material are given in the NIST Certificate of Analysis.